

NEW SPECIES OF ERYTHRONEURA OF THE MACULATA GROUP

(HOMOPTERA: CICADELLIDAE)

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The species described below all occur in Illinois, with additional records for some from the Great Smoky Mountains region. In working out the identity of these species there arose a need for clarification of the definition of the Maculata Group.

In current and past North American literature, the genus *Erythroneura* has been divided into a series of groups on the basis of wing venation. There has been considerable difference of opinion among various authors as to the number and limits of these groups, due in part to the variability of the venational characters, even within the same species, and in part to the admitted arbitrary nature of the groupings. A much sounder basis for subdividing the genus using characters of the male genitalia has been advocated by Ribaut and other European authors. These are summarized by Ribaut 1936 (Faune de France, 31, Typhlocybidae).

A survey of genitalic types of the Maculata Group shows that two major groupings are represented. One contains only the species *illinoensis* (Gillette), with its two color forms *regalis* Beamer and *spectra* McAtee. This species can be placed satisfactorily in Ribaut's Fasciaticollis Group, characterized by the evenly convex foot of the style and the short, simple pygofer hook. The second group includes all the other species placed in the Maculata Group by DeLong and Knull 1945 and Oman 1949 in their check lists of the North American forms; it apparently is not represented in the European fauna, at least as reported by Ribaut. The Maculata Group may be characterized briefly as follows: style with a posterior point or a concave apical margin; pygofer hook straight or elongate, never short and hooklike, simple in most species but cleft to base in some, in which case the base is a single stalk, fig. 1; closely associated with the base of the pygofer hook is a sclerotized but undarkened, short rod which usually has the appearance of a basal spur, figs. 1-10. This is the largest known group in the genus, containing about 130 known species.

Erythroneura mills n. sp.

This species is closely related to *unica* Beamer, differing in the deeper cleft and long upper arm of the pygofer hook, and the shallower phallicata.

Male.—Length 2.9 mm. Ground color whitish cream; head with yellowish open diamond-shaped mark, pronotum with yellowish U-shaped mark; elytra with large pale orange anchor mark and apical spot on clavus, irregular orange marks making a zig-zag down corium, a pink border along the apical crossveins and associated veins, and a black spot in base of cell M_4 .

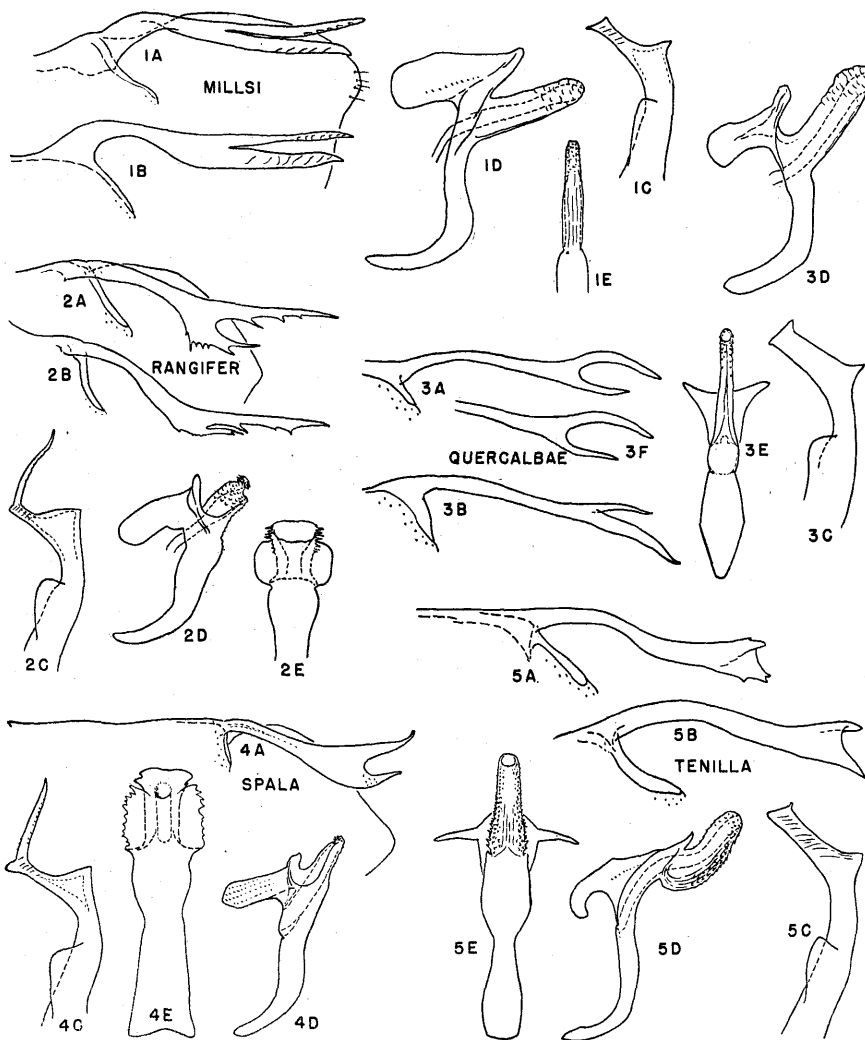
Genitalia as in fig. 1. Pygofer hook cleft slightly more than halfway to base, the two arms subequal in length, the dorsal one slightly stouter; the base is narrow, curved, and turned, and expands into a broader portion before the base of the cleft, this condition being especially apparent from dorsal view, fig. 1B. Style with foot oblique to base, with sharp, projecting heel, sharp anterior point, and with the posterior point represented by only a sharp angulation. Aedeagus with phallicata situated just above the midline; phallicata with lateral aspect long, moderately deep, nearly parallel-sided, and rounded at apex, and with postero-ventral aspect narrow, parallel-sided, and with a very narrow lateral flange from base to well beyond the midpoint.

Holotype, male, Gibsonia, Ill., July 14, 1948, on *Quercus stellata*, Mills and Ross (INHS).

This specimen was taken in company with several similarly marked females from an isolated tree, and may represent a host association.

***Erythroneura rangifer* n. sp.**

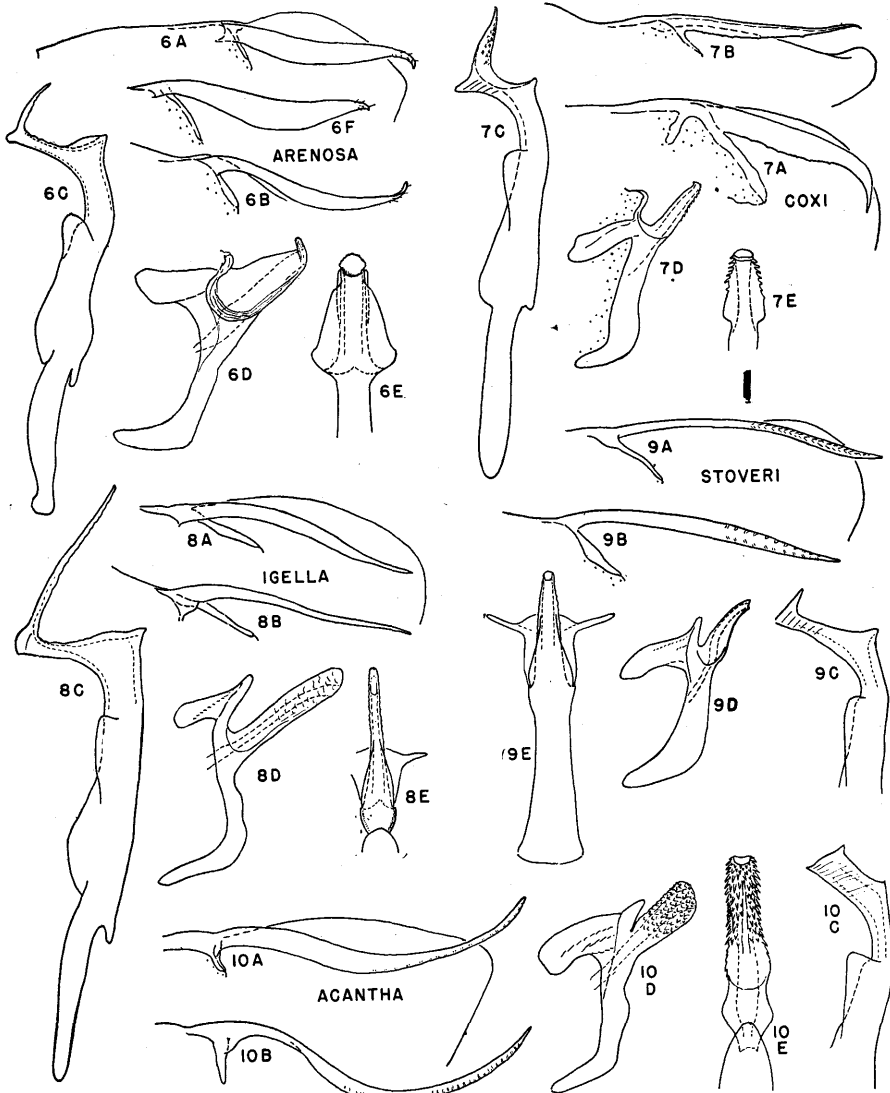
The curious pygofer hook of this species is unlike that of any other known species. The short, wide phallicata indicates a close relationship with *aesculi* Beamer and *spala* n. sp., but in these two the pygofer hook is different.



ILLUSTRATIONS

In the plates accompanying this article, all the figures of a species are magnified to the same scale except for some of the aedeagus, which are 1.5 times the others. Those at a higher magnification are figs. 1D, 1E, 2D, 2E, 4E, 6D, 6E, 9E, and 10E. The view of the aedeagus shown in all E drawings is roughly posterior-ventral, and is the aspect at right angles to the long axis of the phallicata alone.

Male.—Length 2.8 mm. Ground color pale straw color; markings on head and pronotum indistinct; elytra with markings similar to preceding species but those which are orange and pink in that species are pale yellow in this. Genitalia as in fig. 2. Pygofer hook elongate, surpassing apex of pygofer, the base slender and curved, the apex cleft to form a long, slender dorsal arm and a shorter, curved ventral arm, both serrate with a few sharp, projections; the dorsal aspect is markedly sinuate, and the entire apical portion is thin and foliaceous. Style with foot of moderate size, heel large and triangular, anterior point inconspicuous, and posterior point slender, slightly



FIGS. 1-10. Male genitalia of *Erythroneura*. A, pygofer hook, lateral aspect; B, same, dorsal aspect; C, style, drawn at right angles to large expanse of foot; D, aedeagus, lateral aspect; E, aedeagus or phallicata, postero-ventral aspect, in figs. 3E, 5E, 8E, and 9E showing also the lateral expansion of the socket protruding from behind the phallicata; F, pygofer hook, dorso-lateral aspect.

sinuate, and longer than the length of the foot. Aedeagus with phallicata situated near dorsal margin; phallicata very short, fairly deep, and very wide, with sharp lateral projections on the main portion toward apex, bearing laterally a wide, smooth-edged flange extending almost the entire length of the phallicata.

Holotype, male, Rocky Branch, Clark Co., Ill., Sept. 14, 1949, on *Corylus americana*, Stannard and Ross, (INHS).

***Erythroneura quercalbae* n. sp.**

This is a close relative of *mira* Beamer, differing from it in the U-shaped cleft of the pygofer hook and the forceps-like position of the two arms.

Male.—Length 3 mm. Ground color whitish cream; markings on head and pronotum indistinct; elytra with several pale yellow marks in basal portion, beyond this with a few thin, diagonal reddish marks and with a reddish border along the apical crossveins, and with a black mark in the base of cell M_4 . Genitalia as in fig. 3. Pygofer hook with both lateral and dorsal aspects slightly curved, the apical third cleft to form two arms which curve toward each other at apex, the dorsal arm the longer, both arms and the basal portion of the hook slender. Style with foot oblique, the heel small and sharp, the anterior point minute but angulate, and the posterior point represented by a short, sharp, angulation. Aedeagus with phallicata situated just above the middle; phallicata long and fairly deep, the apex almost angulate, the ventral aspect narrow and parallel-sided, the apical portion with sparse imbrications.

Female.—Similar in size, shape, and color to male.

Holotype male, Elkmont, Tenn., Gt. Smoky Mts. National Park, Sept. 1, 1948, on *Quercus alba*, Ross and Stannard, (INHS). Allotype female, same data. Paratypes, same data, 15♂, 12♀. Kickapoo State Park, Ill., July 28, 1948, on *Quercus alba*, Sanderson and Becker (INHS). Paratypes in INHS and collection of D. M. DeLong.

***Erythroneura spala* n. sp.**

This species is closely related to *bifida* Beamer, from which it differs in the swollen and upcurved lateral aspect of the pygofer hook.

Male.—Length 2.8 mm. Ground color whitish; head and pronotum with only indistinct markings; elytra with black spot in base of cell M_4 and with indistinct yellow markings shaped and situated as in *millsi*. Genitalia as in fig. 4. Pygofer hook thin and foliaceous, the lateral aspect curved first down then up, the base slender, the middle portion gracefully expanded, the apex cleft to form a pair of tapering, sharp-tipped arms separated at base by a U-shaped outline. Style slightly oblique, the heel fairly large and angular, the anterior point small and rounded, and the posterior point slender, almost straight, and longer than the foot. Aedeagus with phallicata situated very close to its dorsal point; phallicata short, shallow, but wide and bearing a wide flange with serrate edges.

Holotype, male, Rocky Branch, Clark Co., Ill., Sept. 14, 1949, on *Fagus grandifolia*, Stannard and Ross (INHS). Paratypes, Rocky Branch Cr., Oliver, Ill., April 22, 1949, Stannard and Ross, 1♂ (INHS); Marshall, Ill., April 22, 1949, Stannard and Ross (INHS and coll. D. M. DeLong).

***Erythroneura tenilla* n. sp.**

In general characteristics this species approaches *manus* Beamer, but differs in the shape of the aedeagus and the less sinuate pygofer hook.

Male.—Length 2.9 mm. Ground color whitish; elytra with black spot in base of cell M_4 , reddish border along apical crossveins, and orange spots as follows: an anchor mark and apical mark on clavus, and three sinuate marks on corium. Genitalia as in fig. 5. Pygofer hook with lateral aspect sinuate, dorsal aspect slightly so, fairly robust, gradually expanded toward apex, the latter incised to form dorsal and ventral angles which are slightly serrate with a few sharp, small points. Style with foot oblique, heel sharp but not large, anterior point blunt, posterior point minute but finger-like. Aedeagus with phallicata situated at dorsal point, the socket profile sinuate and the phallicata curving slightly down from it, then up; phallicata fairly deep, its apex rounded, its ventral aspect wide at base and tapering to a fairly narrow apex, its apex and sides with numerous spiculations.

Holotype, male, Elkmont, Tenn., Gt. Smoky Mts. National Park, Sept. 1, 1948, on *Quercus alba*, Ross and Stannard (INHS). Allotype, female, same data. Paratypes, Marshall, Ill., April 22, 1949, in woods, Ross and Stannard, 2 ♀ (INHS and coll. D. M. DeLong).

***Erythroneura arenosa* n. sp.**

This species is a close relative of *marra* Beamer, differing in the wide pygofer hook, unexpanded apex of phallicata, and small heel.

Male.—Length 2.8 mm. Ground color whitish; pattern similar to the preceding species but with the markings pale yellow except for the black spot in cell M₄. Genitalia as in fig. 6. Pygofer hook foliaceous and moderately long, extending to tip of pygofer, slightly sinuate, in lateral view curving ventrad at extreme tip; it is seen at its widest from dorso-lateral view, fig. 6F, when it appears markedly fusiform. Style with foot slightly oblique, heel sharp, ball of heel with a convex flange, instep narrow, anterior point short and round, posterior point slender, sharp, curved slightly toward heel, and a little longer than half length of foot. Aedeagus with phallicata angling only slightly from socket, and its dorsal margin almost contiguous with the dorsal point of the socket; phallicata deep, narrowing toward apex, apex upturned to form a small flange; ventral aspect of phallicata with main body narrow and parallel-sided, each side with a lateral flange which is wide at base and tapers into the body just before apex.

Holotype, male, Thornton, Ill., Sept. 7, 1949, on *Corylus americana*, Ross and Stannard (INHS).

***Erythroneura coxi* n. sp.**

Although key characters indicate a proximity of this species to *continua* Knull and Auten, it does not seem closely related to any known species. From *continua* it may be separated by the bladeliike pygofer hook and less angular posterior point.

Male.—Length 2.7 mm. Ground color white, with irregular pinkish spots on head, thorax, and elytra; these are remarkably similar to the arrangement found in *maculata* (Gillette). Genitalia as in fig. 7. Pygofer hook thin and bladeliike, angling slightly ventrad, its apex curved sharply ventrad and ending just within the outline of the pygofer; lower margin with small, well spaced serrations; basal rod unusually large. Style with foot almost at a right angle with long axis of style; heel small and sharp, anterior point blunt but fairly long, posterior point wide at base, tapering to sharp apex, slightly sinuate, inner margin concave, and as long as foot. Aedeagus with phallicata fairly close to dorsal point and angles only slightly from socket; phallicata shallow, straight, the tip with a slight dorsal point, the ventral aspect fairly narrow with a wide flange down each side, serrate on apical half.

Female.—Size, shape, and color as for male.

Holotype, male, North East, Pa., Oct. 14, 1949, on purple raspberry (*Rubus* sp.), J. A. Cox (coll. D. M. DeLong). Allotype, female, same data. Paratypes, same data, 66 ♂, ♀; same data but Sept. 26, 14 ♀, ♀ (coll. D. M. DeLong and INHS). This seems to be the first definite host record of an *Erythroneura* from *Rubus*.

***Erythroneura igella* n. sp.**

The large foot and extremely long posterior point of the style place this species at once in the *mirifica-penesica-parva* complex. From these it differs in the longer pygofer hook and the shallower phallicata.

Male.—Length 2.8 mm. Ground color whitish; black spot in base of cell M₄, otherwise markings very pale and indistinct. Genitalia as in fig. 8. Pygofer hook curved downward, slightly sinuate, not quite attaining edge of pygofer, of moderate width at base and tapering gradually to a thin apex. Style with large foot set at about a right angle with axis of style; heel small and sharp, anterior point scarcely differentiated, posterior point slender, nearly straight, and exceedingly long, at least one and a half times length of foot. Aedeagus with phallicata set at a sharp angle with socket and situated just above midpoint; phallicata long, shallow, and parallel-sided, its ventral aspect narrow, slightly widened at base and with a small flange at each side on basal half, the apical half of the structure with a few scattered imbrications.

Holotype, male, Belle Smith Springs, Ill., July 16, 1948, on oak, Mills and Ross (INHS). Golconda, Ill., July 23, 1947, on *Quercus imbricaria*, Sanderson and Stannard (INHS).

***Erythroneura stoveri* n. sp.**

The short posterior point of the foot and the elongate, nearly straight pygofer hook place this species in the vicinity of *campona* Robinson, but *stoveri* may be readily distinguished from this and related species by the curious beaklike phallicata.

Male.—Length 2.7 mm. Ground color white; head with thin, pink diamond mark, pronotum with lateral spots and mesal U-spot pinkish; elytra with black spot in base of cell M₄, and pinkish marks as follows: clavus with a middle square mark and an apical mark, corium with scattered marks forming an indefinite and disconnected zigzag, and a border around the apical crossveins. Genitalia as in fig. 9. Pygofer hook elongate, extending slightly beyond pygofer, lateral aspect slightly sinuate, slender, of nearly equal thickness throughout, and pointed at apex, dorsal aspect slightly fusiform and tapering more suddenly toward apex. Style with slightly oblique foot; heel small and projecting, anterior point only a blunt angulation, posterior point sharp, only slightly longer than depth of instep, instep long and slightly but gently concave. Aedeagus with phallicata set near dorsal point, curving out only slightly from socket; phallicata sinuate, widest at base and tapering to a spoutlike apex, with narrow lateral flanges on basal half and very minute serrations toward apex.

Holotype, male, Rocky Branch Cr., Oliver, Ill., April 22, 1949, Ross and Stannard (INHS). Paratypes, same data, 5♂ (INHS and coll. D. M. DeLong).

***Erythroneura acantha* n. sp.**

This species is most closely related to *lenta* Beamer, differing in the tapering pygofer hook and shape of phallicata.

Male.—Length 2.9 mm. Ground color white; markings on head and pronotum indistinct, on elytra of usual type but pale yellow and also indistinct. Genitalia as in fig. 10. Pygofer hook very long, extending beyond pygofer; lateral aspect slightly sinuate and curving dorsad at apex, the basal portion fairly deep, the apical half slender; dorsal aspect very sinuate and appearing to have a slender base. Style with foot oblique; heel, anterior point, and posterior point each represented by a small, sharp angulation; foot in general short and deep, with a nearly straight instep. Aedeagus with phallicata situated near dorsal point, and angling markedly from socket; phallicata of moderate length, lateral aspect slightly clavate, ventral aspect stout and parallel-sided except for a slight enlargement at base, almost the entire phallicata beset with sharp spines.

Holotype, male, Fairfield, Ill., July 14, 1948, on *Carya ovata*, Mills and Ross (INHS). Paratypes, Rocky Branch Cr., Oliver, Ill., April 22, 1949, Ross and Stannard, ♂ (INHS); Edgerwood, Ill., July 23, 1947, on *Quercus imbricaria*, Sanderson and Stannard (coll. D. M. DeLong).

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